AIR QUALITY POLLUTION STANDARDS TABLES

TABLE XX: AIR POLLUTANT EFFECTS AND SOURCES

| **Pollutant** | **Principal Health and Atmospheric Effects** | **Typical Sources** |
| --- | --- | --- |
| **Ozone (O3)** | High concentrations irritate lungs. Long-term exposure may cause lung tissue damage and cancer. Long-term exposure damages plant materials and reduces crop productivity. Precursor organic compounds include many known toxic air contaminants. Biogenic VOC may also contribute. | Low-altitude ozone is almost entirely formed from reactive organic gases/volatile organic compounds (ROG or VOC) and nitrogen oxides (NOx) in the presence of sunlight and heat. Common precursor emitters include motor vehicles and other internal combustion engines, solvent evaporation, boilers, furnaces, and industrial processes. |
| **Carbon Monoxide (CO)** | CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen. CO also is a minor precursor for photochemical ozone. Colorless, odorless. | Combustion sources, especially gasoline-powered engines and motor vehicles. CO is the traditional signature pollutant for on-road mobile sources at the local and neighborhood scale. |
| **Respirable Particulate Matter (PM10)** | Irritates eyes and respiratory tract. Decreases lung capacity. Associated with increased cancer and mortality. Contributes to haze and reduced visibility. Includes some toxic air contaminants. Many toxic & other aerosol and solid compounds are part of PM10. | Dust- and fume-producing industrial and agricultural operations; combustion smoke & vehicle exhaust; atmospheric chemical reactions; construction and other dust-producing activities; unpaved road dust and re-entrained paved road dust; natural sources. |
| **Fine Particulate Matter (PM2.5)** | Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and produces surface soiling. Most diesel exhaust particulate matter – a toxic air contaminant – is in the PM2.5 size range. Many toxic &other aerosol and solid compounds are part of PM2.5 | Combustion including motor vehicles, other mobile sources, and industrial activities; residential and agricultural burning; also formed through atmospheric chemical and photochemical reactions involving other pollutants including NOx, sulfur oxides (SOx), ammonia, and ROG. |
| **Nitrogen Dioxide (NO2)** | Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. Contributes to acid rain & nitrate contamination of stormwater. Part of the “NOx” group of ozone precursors. | Motor vehicles and other mobile or portable engines, especially diesel; refineries; industrial operations. |
| **Sulfur Dioxide (SO2)** | Irritates respiratory tract; injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, steel. Contributes to acid rain. Limits visibility. | Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing; some natural sources like active volcanoes. Limited contribution possible from heavy-duty diesel vehicles if ultra-low sulfur fuel not used. |
| **Lead (Pb)** | Disturbs gastrointestinal system. Causes anemia, kidney disease, and neuromuscular and neurological dysfunction. Also a toxic air contaminant and water pollutant. | Lead-based industrial processes like battery production and smelters. Lead paint, leaded gasoline. Aerially deposited lead from older gasoline use may exist in soils along major roads. |
| **Sulfates** | Premature mortality and respiratory effects. Contributes to acid rain. Some toxic air contaminants attach to sulfate aerosol particles. | Industrial processes, refineries and oil fields, mines, natural sources like volcanic areas, salt-covered dry lakes, and large sulfide rock areas. |
| **Hydrogen Sulfide (H2S)** | Colorless, flammable, poisonous. Respiratory irritant. Neurological damage and premature death. Headache, nausea. Strong odor. | Industrial processes such as: refineries and oil fields, asphalt plants, livestock operations, sewage treatment plants, and mines. Some natural sources like volcanic areas and hot springs. |
| **Visibility Reducing Particles (VRP)** | Reduces visibility. Produces haze. NOTE: not directly related to the Regional Haze program under the Federal Clean Air Act, which is oriented primarily toward visibility issues in National Parks and other “Class I” areas. However, some issues and measurement methods are similar. | See particulate matter above. May be related more to aerosols than to solid particles. |
| **Vinyl Chloride** | Neurological effects, liver damage, cancer. Also considered a toxic air contaminant. | Industrial processes |

TABLE XX: STATE AND FEDERAL CRITERIA AIR POLLUTANT STANDARDS AND STATUS

Instructions: In the last two columns of this table (State Project Area Attainment Status and Federal Project Area Attainment Status), please choose only from the following options:

STATE: Nonattainment or Attainment. Identify areas if multiple designations apply.

FEDERAL: Nonattainment or Attainment-Maintenance or Attainment-Unclassified. Non-Attainment options for Ozone include Extreme, Severe, Serious, Moderate, Marginal, or Basic. Non-Attainment options for PM 2.5 include Moderate or Serious. Identify areas if multiple designations apply.

Delete these instructions before finalizing.

| **Pollutant** | **Averaging Time** | **State Standard [[1]](#endnote-1)** | **Federal Standard [[2]](#endnote-2)** | **State Project Attainment Status** | **Federal Project Area Attainment Status** |
| --- | --- | --- | --- | --- | --- |
| **O3 [[3]](#endnote-3)** | 1 hour | 0.09 ppm [[4]](#endnote-4) | N/A |  | N/A |
| **O3** | 8 hours | 0.070 ppm | 0.070 ppm (4th highest in 3 years) |  |  |
| **CO [[5]](#endnote-5)** | 1 hour | 20 ppm | 35 ppm |  |  |
| **CO** | 8 hours | 9.0 ppm | 9 ppm |  |  |
| **CO** | 8 hours (Lake Tahoe) | 6 ppm | N/A |  | N/A |
| **PM10****[[6]](#endnote-6)** | 24 hours | 50 μg/m3 [[7]](#endnote-7) | 150 μg/m3 (expected number of days above standard < or equal to 1) |  |  |
| **PM10** | Annual | 20 μg/m3 | N/A |  | N/A |
| **PM2.5 [[8]](#endnote-8)** | 24 hours | N/A | 35 μg/m3 vi | N/A |  |
| **PM2.5** | Annual | 12 μg/m3 | 12.0 μg/m3 |  |  |
| **NO2** | 1 hour | 0.18 ppm | 0.100 ppm [[9]](#endnote-9) |  |  |
| **NO2** | Annual | 0.030 ppm | 0.053 ppm |  |  |
| **SO2 [[10]](#endnote-10)** | 1 hour | 0.25 ppm | 0.075 ppm (99th percentile over 3 years) |  |  |
| **SO2** | 3 hours | N/A | 0.5 ppm [[11]](#endnote-11) | N/A |  |
| **SO2** | 24 hours | 0.04 ppm | 0.14 ppm (for certain areas) |  |  |
| **SO2** | Annual | N/A | 0.030 ppm (for certain areas) | N/A |  |
| **Pb****[[12]](#endnote-12)** | Monthly | 1.5 μg/m3 | N/A |  | N/A |
| **Pb** | Calendar Quarter | N/A | 1.5 μg/m3 (for certain areas) | N/A |  |
| **Pb** | Rolling 3-month average | N/A | 0.15 μg/m3 [[13]](#endnote-13) | N/A |  |
| **Sulfates** | 24 hours | 25 μg/m3 | N/A |  | N/A |
| **H2S** | 1 hour | 0.03 ppm | N/A |  | N/A |
| **Visibility Reducing Particles (VRP) [[14]](#endnote-14)** | 8 hours | Visibility of 10 miles or more (Tahoe: 30 miles) at relative humidity less than 70 % | N/A |  | N/A |
| **Vinyl Chloride xii** | 24 hours | 0.01 ppm | N/A |  | N/A |

Adapted from the [California ARB Air Quality Standards chart](https://ww3.arb.ca.gov/research/aaqs/aaqs2.pdf)

Greenhouse Gases and Climate Change: Greenhouse gases do not have concentration standards for that purpose. Conformity requirements do not apply to greenhouse gases.

1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations. [↑](#endnote-ref-1)
2. Federal standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 μg/m3 is equal to or less than one. For PM2.5, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies. [↑](#endnote-ref-2)
3. On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm. Transportation conformity applies in newly designated nonattainment areas for the 2015 national 8-hour ozone primary and secondary standards on and after August 4th, 2019 (see [Transportation Conformity Guidance for 2015 Ozone NAAQS Nonattainment Areas](https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100UN3X.pdf)). [↑](#endnote-ref-3)
4. ppm = parts per million [↑](#endnote-ref-4)
5. Transportation conformity requirements for CO no longer apply after June 1, 2018 for the following California Carbon Monoxide Maintenance Areas (see [U.S. EPA CO Maintenance Letter](https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/co-maintenance-letter-a11y.pdf)). [↑](#endnote-ref-5)
6. On December 14, 2012, the national annual PM2.5 primary standard was lowered from 15 μg/m3 to 12 μg/m3. The existing national 24-hour PM2.5 standards (primary and secondary) were retained at 35 μg/m3, as was the annual secondary standard of 15 μg/m3. The existing 24-hour PM10 standards (primary and secondary) of 150 μg/m3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years. [↑](#endnote-ref-6)
7. μg/m3 = micrograms per cubic meter [↑](#endnote-ref-7)
8. The 65 μg/m3 PM2.5 (24-hr) NAAQS was not revoked when the 35 μg/m3 NAAQS was promulgated in 2006. The 15 μg/m3 annual PM2.5 standard was not revoked when the 12 μg/m3 standard was promulgated in 2012. Therefore, for areas designated nonattainment or nonattainment/maintenance for the 1997 and or 2006 PM2.5 NAAQS, conformity requirements still apply until the NAAQS are fully revoked. [↑](#endnote-ref-8)
9. Final 1-hour NO2 NAAQS published in the Federal Register on 2/9/2010, effective 3/9/2010. Initial area designation for California (2012) was attainment/unclassifiable throughout. Project-level hot spot analysis requirements do not currently exist. Near-road monitoring starting in 2013 may cause re-designation to nonattainment in some areas after 2016. [↑](#endnote-ref-9)
10. On June 2, 2010, a new 1-hour SO2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75ppb. The 1971 SO2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved. [↑](#endnote-ref-10)
11. Secondary standard, the levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant rather than health. Conformity and environmental analysis address both primary and secondary NAAQS. [↑](#endnote-ref-11)
12. The ARB has identified vinyl chloride and the particulate matter fraction of diesel exhaust as toxic air contaminants. Diesel exhaust particulate matter is part of PM10 and, in larger proportion, PM2.5. Both the ARB and U.S. EPA have identified lead and various organic compounds that are precursors to ozone and PM2.5 as toxic air contaminants. There are no exposure criteria for adverse health effect due to toxic air contaminants, and control requirements may apply at ambient concentrations below any criteria levels specified above for these pollutants or the general categories of pollutants to which they belong. [↑](#endnote-ref-12)
13. Lead NAAQS are not considered in Transportation Conformity analysis. [↑](#endnote-ref-13)
14. In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively. [↑](#endnote-ref-14)